

Development of the learning result of innovation and information technology in education using CIPPA, for third year students in the Bachelor of Education Program, Nakhon Phanom University

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ABSTRACT

This research proposes 1) to develop the learning management plan for the Innovation and Information Technology in Education of the 3rd year students of the Bachelor of Education Program by using CIPPA effectively according to the criteria 75/75; 2) to study the effectiveness index of the learning management plan for the Innovation and Information Technology in Education of the 3rd year students of the Bachelor of Education Program by using CIPPA; 3) to compare the learning achievement of the 3rd year students before and after learning, and 4) to study the learning satisfaction of the 3rd year students.

The samples are 33 third-year students enrolling in the Bachelor's degree in Education Program in Early Childhood Education, Faculty of Liberal Arts and Science, Nakhon Phanom University, in the 2nd semester of academic year 2012. The samples are selected by cluster sampling. The research tools include 9 programs of learning activity by CIPPA for the Innovation and Information Technology in Education; Four-choice objective test on learning achievement (40 questions). The item discrimination range from 0.21 – 0.84 and the coefficient of reliability is 0.87. The 20-question survey on student learning satisfaction has item discrimination from 0.30 – 0.67 and the coefficient of reliability is 0.93. The statistics used in the data analysis are percentage, mean, standard deviation and the dependent t-test is used to test the hypothesis.

1. The learning management plan for the Innovation and Information Technology in Education has an effectiveness of 89.70/83.67.
2. The effectiveness index of the learning management plan for the Innovation and Information Technology in Education is 0.7391, which indicates that the test scores of students after learning are higher than before learning by 73.91%.
3. The 3rd year students have the learning achievement scores after learning higher than before learning, which is statistically significant at .05 level.
4. The 3rd year students have the highest level ($\bar{X} = 4.54$) of learning satisfaction.

Keywords: development, learning outcomes, CIPPA model, innovation, Education course

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INTRODUCTION

In globalized society, information technology is an important foundation for the development which plays a major role in every educational institution throughout the learning process and the quality assurance of higher education courses in the university. Learners need to always acquire knowledge and know how to use information technology and communication to encourage continuous development of their own and society. Teaching and learning systems based on information technology and communication can enhance the learning achievement and ability of learners in using information technology and communication which is a desirable qualification in today's society.

In addition, the roles of knowledge and technology in the economy have changed dramatically in this era. This is known as the era of the knowledge economy because it is the knowledge of the mechanisms and result of economic growth. (Santi vijakkanalun. 2001: 35) Learning should be consistent with the actual status and a process that allows the students to develop critical thinking, self-directed learning, be enthusiastic about seeking new knowledge to develop their works and quality of life. Currently, information technology and communication are brought to apply in learning and teaching more and more, especially communication in computer network. (Amonwit Nakorntan. 1997: 22)

Thus, the higher education shall enhance the students' ability to learn and acquire knowledge so that they will be prepared for social, economic and environmental changes, particularly the ability to search for information they need. Information literacy skills are the lifelong learning skills, and the basic skills of effective self-directed learning. To have information literacy skills is to be the persons who are intellectual, and have the abilities to research and solve the problems they face. So, they set up a standard of information literacy for students in each level to encourage students to develop information literacy according to standards. The information literacy implies a number of skills: the skill to recognize an information need, to search, to analyze and use information technology to improve performance and decision making. These skills are important to know how to learn effectively. (Numtip Vipawin. 2007 :81)

Currently, we still have the problems in Thailand's higher education that the students lack the research habit. This is the result of the traditional teaching methods that the teachers impart knowledge to students and it seems that only the classroom is the sole source of learning. The case studies of the priorities of the materials necessary for student teachers in the information society discovered that in the student teachers' views, the information searching was the least important. (Utumporn Chamonmarn. 2006 : 119).

To develop students to be the lifelong learners is one of the important roles of higher education institutions. Each institution aims to teach students to think critically and systematically, and practice their systematic learning in order to be good citizen and work for a better society. Therefore, information literacy is a key factor which leads to this aim. Information literacy skills make students to learn widely not only in the rectangular classrooms; students are able to learn by their own interests without limitation of time and place (Suchin Buddeesuwan. 2007:73). The learning CIPPA model is a form of teaching that focuses on student center.

The learning activities help students to create their own knowledge, and interact with others and environment. Students have the opportunity to make body movement and learn the skills and processes that are the necessary skills for their daily living. Students can bring knowledge to use in the social and daily life that enhances them to learn more and more (Tisna Khammanee. 2005: 11-23).

The researcher believes that CIPPA teaching concept is another form of emphasizing on body of knowledge and group process. It is also the proper teaching method applying in

teaching demonstration in order to develop and increase the students' learning achievement. Particularly, the courses of innovation and educational information technology are the teacher compulsory subjects that all Bachelor of Education students have to study as a foundation for other subjects that help students to achieve the learning objectives faster. Therefore, the effective teaching in this course will be beneficial to the pursuit of knowledge in other subject of research and awareness. The researcher pays attention to and recognizes the mentioned importance and tries the model of CIPPA teaching concept in this course to be the good example for developing other courses.

PURPOSE

This research has the following objectives:

1. To develop the learning management plan for the Innovation, Technology and Information in Education of the 3rd year students of the Bachelor of Education Program by using CIPPA effectively according to the criteria 75/75.
2. To study the effectiveness index of the learning management plan for the Innovation, Technology and Information in Education of the 3rd year students of the Bachelor of Education Program by using CIPPA.
3. To compare the learning achievement of the 3rd year students before and after learning.
4. To study the learning satisfaction of the 3rd year students.

HYPOTHESIS

The third year students studying in the Early Childhood Program of Bachelor of Education of Nakhon Phanom University have higher scores of learning achievement on post-test than pre-test.

PROCEDURE

Population and sample

The population is the third year students of the Early Childhood Program in the Bachelor of Education, Faculty of Arts and Sciences, Nakhon Phanom University enrolling in Innovation and Educational Information Technology in the first semester of academic year 2012. The population consists of 107 students from the three classrooms: 33 students of class number 3/1, 43 students of class number 3/2, 31 students of class number 3/3. The sample group is the 33 of the third year students of class no. 3/1 studying in the Early Childhood Program in the Bachelor of Education, Faculty of Arts and Sciences, Nakhon Phanom University randomized by Cluster Random Sampling.

Research Instruments

There are 3 types of instruments used in the research.

1. 9 learning management plans for Innovation and Information Technology in Education subject using the CIPPA for the third year students of Bachelor of Education, Nakhon Phanom University, in the first semester of academic year 2012.
2. A four-multiple choice achievement test, consisting of 40 items, for Innovation and Information Technology in Education subject using CIPPA model for the third year students in the Bachelor of Education, Nakhon Phanom University.

3. A satisfaction survey questionnaire with a five-point scale, consisting of 20 items, for the 3rd year students of Bachelor of Education program using the CIPPA model. It is used to measure their satisfaction with the learning management plans for the Innovation and Information Technology in Education subject, using CIPPA model.

Operation

This research is an experimental research, which is comprised of two major steps:

Step 1

The researcher has determined the process for creating and validating the instruments as follows.

1. Organize the learning management plan for the subject of Innovation and Information Technology in Education by using CIPPA and submit the plan to 10 experts to check the consistency between the objectives, content, learning activities, measurement and evaluation.
2. Revise the plan according to the recommendation of the experts. And calculate the average from the experts' evaluation scores of the learning management plan and compare it with the threshold, which is calculated from Likert-type Rating Scale.
3. Try out the plan which has been evaluated by experts to test its quality, by conducting experiments (try-out) with 31 third year students of Class 3/3 in the Early Childhood Program, in the second semester of the academic year 2011. These students are not the sample group. The experiments are conducted to test the appropriateness of the activity's time, the activities and materials used. The researcher corrects the flaws in the experiment until the learning management plan is perfect and then use it to try out with the research sample.
4. Design a test to measure the learning achievement in the subject of Innovation and Information Technology in Education for the 3rd year students of the the Early Childhood Program. The test, consisting of 40 items of four multiple-choice, was submitted to the same experts in order to calculate the consistency index of the test and the learning objectives, as well as to verify the accuracy of content and language used that can be measured according to the purposes of learning.
5. After the learning achievement test was examined by the experts, measure the internal consistency between each test item and learning objectives. Each item should have consistency index values between 0.67 to 1.00. (Somnuek Puttiyathani. 2003 : 220). It is found that the test has the consistency index of 1.00.
6. Try out the test with 31 third year students of Class 3/3 in the Early Childhood Program, in the second semester of the academic year 2011. These students are not sample group.
7. Give scores to the try-out test results to analyze the difficulty index (p-value) and discrimination index (B) based on Brennan; select the test whose difficulty index is from 0.20 – 0.80 and discrimination index from 0.20 – 1.00 to use as instrument. (Boonchom Srisaard. 2002: 96) The result showed that the difficulty index (p) fall between 0.30 to 0.50 and the discrimination between 0.20 to 0.90.
8. Analyze the test to calculate the reliability using the method of Lovett. The reliability of the whole test was 0.84.
9. Create a student satisfaction survey, consisting of 25 items, to determine their satisfaction with the learning management plans for the Innovation and Information Technology in

Education subject, using CIPPA model based on the Likert's method. The questionnaire used a five-point scale.

Then design an appropriateness assessment test for the experts to assess the appropriateness of the satisfaction survey. The assessment test was submitted to the same experts for reviewing the accuracy of content and calculating the consistency index of the satisfaction survey. Select the question whose consistency index is from 0.67 up to use. The result showed that the consistency index of every item was 1.00.

10. Try out the revised satisfaction survey with 31 third year students of Class 3/3 in the Early Childhood Program. These students are not sample group. Analyze the results to calculate the discrimination index using statistical software package. The discrimination (r_{xy}) ranges between 0.30 – 0.67.
11. Analyse the satisfaction survey to calculate the reliability using Cronbach's coefficient alpha. The reliability of the whole questionnaire was 0.93. (Boonchom Sisa-ard. 2002: 96-99)
12. Validate the tryout and revised 20-item satisfaction survey questionnaire and use it as the research instrument.

Step 2

This research study was carried out on a sample of 31 third year students of the Early Childhood Program in the Bachelor of Education, Faculty of Arts and Sciences, Nakhon Phanom University, in the first semester of the academic year 2012.

The research process consisted of the following steps.

1. Conduct a pretest by using achievement test to assess sample students before learning. Then the test were scored and recorded.
2. Teach the subject of Innovation and Information Technology in Education using CIPPA model for one semester.
3. After finishing the experiment, conduct a posttest using the same achievement test.
4. Measure the student satisfaction by using the questionnaire.

Data analysis

1. Basic statistics for the percentage, and the average score obtained from the evaluation of the student's achievement posttest scores.
2. The efficiency of the learning management courses innovation and technology education by using CIPPA model Standard 75/75 with a percentage of the average of the scores obtained from the assessment during class with a percentage of the national average, achievement posttest scores using the formula for E1 and E2.
3. Find the index of the effectiveness of the Plan's overall achievement test scores before and after learning, Using the formula for E.I (effectiveness index : **E.I.**)
4. Compare the mean scores of achievement during and after learning of students with learning management plan innovation and technology education courses by using CIPPA model with statistical t-test (Dependent Samples).
5. Analysis of satisfaction in the learning of students using the CIPPA model of respondents measure satisfaction score based on the criteria specified, then points to the mean, and the criteria for interpreting the mean.

RESULTS

The results revealed as the four following steps:

Step 1. Plan performance analysis of innovation and technology education courses by using CIPPA model third year student of Bachelor of Education course, Nakhon Phanom University under the 75/75. found that, The mean score of the study to measure knowledge, innovation and technology education by using CIPPA for third year students Bachelor of Education course, Nakhon Phanom University Plan 9 had an average of 80.12 percent, 89.02 points test achievement after learning. Had an average of 24.18 percent from 83.63 and performance, the Plan, Department of Innovation and Information Technology in Education, by using CIPPA for the third year students Bachelor of Education course, Nakhon Phanom University criteria $E1/E2 = 89.02/83.63$.

Step 2. Analysis of cost effectiveness index Plan Innovation and technology education courses by using CIPPA model third year student of Bachelor of Education course, Nakhon Phanom University, found that, Effective index of the Plan, department of innovation and Information Technology in Education by using CIPPA for third year students is equal to 0.7391, indicating that the students learning progress is equal to 0.7391 or 73.91 percent.

Step 3. Comparing the academic achievement of students by providing innovative learning activities and information technology education courses by using CIPPA model, found that, students in third year studying in the Bachelor of Education, Nakhon Phanom University using the learning management plans through innovation and educational information technology course had the learning achievement of the post-test higher than the pre-test at .05 level of statistical significance.

Step 4. The satisfaction of students toward the learning activities is at a highest level ($\bar{X} = 4.54$). The highest mean comprises total three items. They are item no. 19, "I satisfy the scores when I did by myself every time."; item no. 17, "I and my peers have learnt and helped each other in the group.", and item no. 11, "There are the interesting materials supplemented while learning in the period of innovation and educational information technology course"

DISCUSSION

The effectiveness of the learning management plan for the Innovation and Information Technology for Learning subject which emphasize the learning activities organizing by CIPPA model is 89.02/83.63 which is higher than the criterion of 75/75 and corresponds with the research results of Chantee Sittisat (2006:99-108). It studies the learning activities organizing plan by using CIPPA model, on the subject of the linear equation of one variable for Matthayomsuksa 1 students. The sample consists of 23 students of Matthayomsuksa 1, Ban Nong Khu School, Mahasarakham Secondary Educational Service Area Office 1, 2nd semester, school year 2005. The objective is to develop the learning activities organizing plan by using CIPPA model on the subject of the linear equation of one variable for Matthayomsuksa 1 students, which has effectiveness based on the criterion of 75/75. It studies the impact factor and learning retention of students with the learning management plan, and the results are as follows:

- 1) The learning activities organizing plan by using CIPPA model on the subject of the linear equation of one variable for Matthayomsuksa 1 students has an effectiveness of 78.4216/76.09.
- 2) The learning activities organizing plan by using CIPPA model on the subject of the linear equation of one variable for Matthayomsuksa 1 students has an efficacy of 0.6421.

3) The Matthayomsuksa 1 students who study by using learning activities organizing plan by CIPPA model on the subject of the linear equation of one variable can achieve the learning retention totally after two weeks of study. It is because the researcher adheres to the idea and principle of the learning activities organizing of CIPPA model by Tisana Khaemane and others (1999: 57-59) which emphasizes self-directed learning of the students. The students learn how to connect their prior knowledge to the new experience which results in the meaningful learning and the students can better understand the lesson. By engaging students in group learning process, we can promote the interaction between students. During the group activities, students can learn about each other, consult and help each other. The high-skilled students can help the low-skilled students complete the activities. During the activities, the students can make body movement in doing activities together and the student's perception is successful. By the learning process, the students use the process as a learning tool, such as the thinking process, problems solving, discussion and knowledge exchange, so the students can develop their intelligence, good relationship, and more emotional control when they have to do activities together.

The effectiveness index of the students' learning after studying by the learning management plan for Innovation and Information Technology for Learning subject which emphasizes the learning activities organizing using CIPPA model is 0.7391 or 73.91%. It means that students who study by the learning management plan for the subject of Innovation and Information Technology for Learning which emphasizes the learning activities organizing using CIPPA model show progress in their learning. This is shown in the average test score before learning which is 11.18 or 37.27%, and the average test score after learning which is 25.09 or 83.63%. It means that the students have better performance by 0.7391 or 73.91%. That is because the researcher has organized learning activities in which the students can participate according to CIPPA model and has given advice to the students closely which corresponds with the research results of Chantee Sittisat (2006:89-94). The research measures the effectiveness index of the result of the learning activity by using CIPPA model on the subject of the linear equation of one variable for Matthayomsuksa 1 students, which is 0.6421 or 64.21%. The research of Poream Saengchalee (2006:122-134) measures the effectiveness index of the subject of parallel lines by using learning activities organizing of CIPPA model for the Matthayomsuksa 2 students which is 0.7107 or 71.07%. The research of Pilaiwan Sathit (2005:94-101) measures the effectiveness index of mathematics learning by using CIPPA model, which is 0.7254 or 72.54%.

The comparison results of the learning achievement before and after learning of the 3rd year students of the Bachelor of Education Program, Nakhon Phanom University in the subject of the Innovation and Information Technology for Learning using CIPPA model showed that the test scores of the students after learning are higher than before learning, which is statistically significant at .05 level corresponding to the formulating hypothesis. Besides, it is found that the evaluation of learning achievement before learning has an average of 11.18, while the evaluation after learning has an average of 25.09 which is higher. The standard deviation of the evaluation before learning is 2.11, while the standard deviation of the evaluation after learning is 1.15, which is lower. It shows that after learning, the test scores are likely to come into the same range. This indicates that the use of learning management plan of CIPPA model can increase the learning achievement of the students, as well as help students to obtain their expected scores. This corresponds to the research results of Ampa Buisirirak, Kajeerat Nontapa, Nantira Pothienthong (2002: 5-18) It can be summed up that the factors that encourage students to be more interested in their learning are as follows:

- 1) Organizing learning activities by using CIPPA model can train students to join in knowledge construction, and social interaction with the teachers, classmates and situations corresponding to the idea of constructivism.
- 2) Let the students work together. This will build a process of good working relationships between teachers and students in order to make students bear the responsibility for their duties, to prepare them to be a good leader and good follower and to teach them to be a reasonable person who listens to other people's opinions.
- 3) Learning management that uses the CIPPA model has steps to carry out learning activities which are based on the specific learning management plan. Students will take responsibility for their works and learn how to make a plan which will promote creativity and freedom in learning and give them the opportunity to work according to their abilities, skills and their own interests. This allows them to develop their full potential with the help of the teachers who act as a facilitator.
- 4) Organizing learning activities by using the CIPPA model emphasizes the development of students' thought processes and their initiative, which shares a similarity with the constructivism learning theory in that a person can acquire knowledge on his own and it can be constantly developed.
- 5) Organizing learning activities by using the CIPPA model is considered a combined action of a group of people who work together to obtain knowledge. Before starting any learning activities, students are required to stay in their common interest groups. This focuses on having them participate by doing activities together, sharing their ideas, exchanging their roles and interacting with one another. Each student will have to assist other members in learning so that everyone can learn the same thing. Arranging a proper classroom environment can also evoke students' enthusiasm in learning. As a result, it leads to the higher learning achievement after study.

Overall, students have the highest level of satisfaction toward the learning activities organizing of CIPPA model. This is consistent with Viranee Phikunthong's research result (2006 : 70-76), which revealed the students' satisfaction toward the learning method using the CIPPA learning model in creating crafts from recycled materials was at the high level both in general and in each aspect including the classroom environment, teachers, contents, learning activities in terms of materials and learning sources and the evaluation.

The results also match with Runglawan Dermtamram's study (2004 : 96-106) which showed that Matthayomsuksa 3 students' satisfaction toward the learning method using the CIPPA learning model in "Khleng Lokkanit" lesson in Thai Language 306 subject was at the high level. Since teaching Thai language by using learning activities organizing of CIPPA model has increased students' learning achievement, Thai language teachers should be supported to continue using it in organizing learning activities in other contents as well. This is because the teachers have reviewed prior knowledge to prepare to connect it with the new knowledge. Teachers have also created activities that allow students to plan and design their own learning. They organized activities that students can practically use instructional media or real objects that are easy to find in order to connect the prior knowledge with the new one. Moreover, the teachers gave students advice and acted as a consultant when students have problems during the work or while working in groups. Students participated in choosing interesting subjects to learn and find new knowledge. They searched from different knowledge sources both in the real situations and from the documents. Students worked and learned in groups and had the opportunity to give knowledge to their classmates as well as gaining knowledge from others. Students had a chance to present their opinions, discuss things thoroughly and present their group works. The pride of group achievement is that each student has helped. Students have concluded the information themselves and have expressed their opinions freely both during the study and the presentation. They have improved their

problem solving skills and have evaluated their friends' works and the fellow members' working processes. They could evaluate the desirable qualities of group members. There are several methods to measure and evaluate and the learning activities should be organized regularly.

SUGGESTIONS

From this study, the researcher has the following suggestions which may benefit the person involved.

General suggestions

- Before organizing any learning activities, teachers should explain the role of students in doing the activities to make them understand their duties.
- Teachers should encourage and give students advice about diverse learning sources so that the students can practice to obtain the skill in searching for information. This is considered a self-seeking knowledge which makes them learn purposefully.
- An intimate classroom environment should be created to reduce anxiety and stress during the teaching and learning period.
- In organizing the class for Innovation and Information Technology for Learning subject by using the CIPPA model, teachers should add the moral principles and ethics in each process.

Suggestions for further study

- The outcome of organizing learning activities by using the CIPPA model should be kept for further study in other subjects.
- The outcome of organizing learning activities by using the CIPPA model should be compared with other teaching methods which significantly contain the learner-based activities.
- The outcome of organizing learning activities by using the CIPPA model should be tested with other variables such as analysis thinking, creativity, work building skills, etc.

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